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# SOME RECENT PALEOLITHIC DISCOVERIES

### By GEORGE GRANT MACCURDY

The incoming year will witness the celebration of the fiftieth anniversary of the appearance of Darwin's *Origin of Species.* The celebration in this country began with the Darwin Anniversary Meeting of the American Association for the Advancement of Science during convocation week. Every one is familiar with the uplift Darwin's work gave to science as a whole. Not the least among the beneficent results was the impetus given to the study of anthropology, particularly prehistoric archeology. By a singular coincidence the very year (1859) that the Darwinian theory was published, Prestwich visited the valley of the Somme and satisfied himself of the authenticity of Boucher de Perthes's discoveries in the river drift at Abbeville. It is therefore just fifty years since the first general recognition of paleoliths as artifacts. In visiting some new paleolithic stations during the past summer it occurred to me that this might be a fitting time to speak of certain recent developments in the European field.

One of the most important paleolithic discoveries in recent years is that made by Herr Emil Bächler, Director of the Natural History Museum in St Gallen, Switzerland. The Alpine region had not been considered seriously as a field for paleolithic research, since the latter period closed before the retreat of the glaciers to anything like their present extent. It is true man might have penetrated into the Alps during an interglacial period, but the evidences of his presence would have been destroyed by the succeeding glaciation. Two stations in Switzerland of the Magdalenian epoch have been known for years, viz., Schweizersbild and Kesslerloch, but these are north of the Rhine in Canton Schaffhausen.

It remained for Herr Bächler to make the discovery, some four years ago, of a station of Mousterian age; not in a valley, or even the foot-hills, but in the Säntis mountains which lie between the lakes of Constance and Zürich.

The station in question is on the Ebenalp (above Appenzell) at a height of 1477 to 1500 meters. It consists of two caverns, with southeastern exposure, that enter the precipitous face of the rock, and one of which penetrates backward and upward, giving access to the top of the mountain as well as to the Weissbach valley lying to the northwest. The caverns are reached by foot-path from Weissbad, the most frequented one being by way of the gap that separates the Bommenalp from the Ebenalp. This gap was produced by faulting which left the Ebenalp standing about 300 meters above its neighbor. The last part of the way is very steep but protected by a railing. It would, in fact, be absolutely broken at one point were it not for a wooden bridge anchored to the vertical face of the

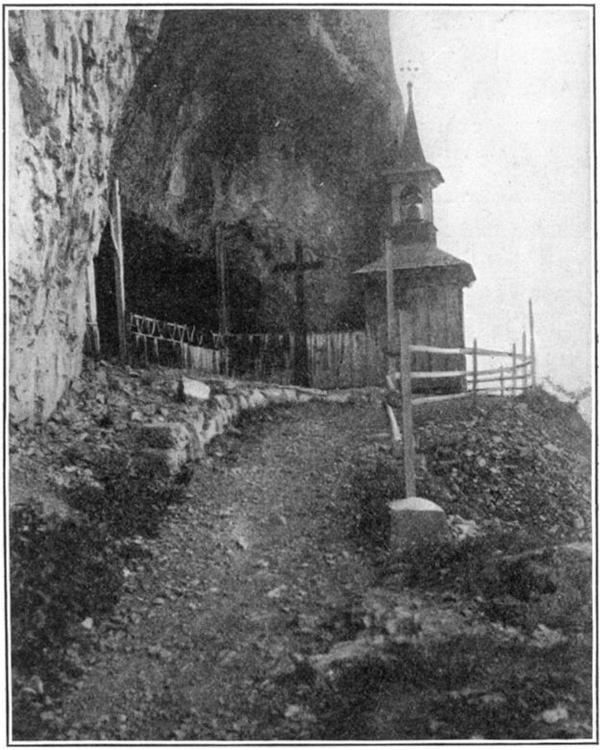

FIG. 138. — Entrance to the Lower Cavern of Wildkirchli, Canton Appenzell, a Station of Mousterian Age at a Height of 1477 Meters.

rock. This is at a point just below the first or lower cavern. It is probable therefore that paleolithic man did not reach the caverns from this side, but rather from the back of the mountain and by way of the upper cavern. The communication between the two is by means of a narrow ledge. (See fig. 138.)

These caverns have been known since 1621, and there is a legend to the effect that at a much earlier date they were inhabited by wild men. The little pilgrimage chapel of Wildkirchli that gives its name to the place was founded by Dr Paulus Ulmann (1613–1680), priest at Appenzell. The chapel is in the lower cavern, and in the upper cavern where the hermit house once stood there is now the Wildkirchli Inn. The last hermit died in 1851, since which time Wildkirchli has been rather a *belvedere* for mountain climbers than a place of religious pilgrimage. The views are certainly superb and well repay the toilsome ascent. A place so full of the spirit of the past and of natural charms could not well escape the romancer, as witness the last chapters of the historical novel, *Ekkehard*, by the celebrated German writer, Viktor von Scheffel.

As early as 1861 Rütimeyer announced the presence of bones of *Ursus spelæus* and *Capra* (*ibex* and *rupicapra*) in the floor deposits of Wildkirchli. Before that date the hermits used to pick up bones of the cave bear and sell them to the pilgrims. Bächler began his researches which led to the discovery of a pure Mousterian industry during the winter of 1903–04, and continued them during the two following winters. Winter is the best time to work, as the caverns are then dry, relatively warm, and free from visitors.

The deposits are about five meters thick and cover an area of several hundred square meters, so that the amount still to be excavated is much greater than that already done. About 99 per cent of the bones found are of the cave bear, the number of individuals represented by the finds to date being approximately 200. These remains have been found practically at all levels save in the layer at the top which has a thickness of one-half meter. Mousterian implements are found in the same horizons as the faunal remains. They are made of quartzite and flint; also of cave-bear bone. The quartzites were picked up in the Weissbach valley several hundred meters below and carried to the caverns there to be worked into tools. Some of the better formed implements are made of a greenish flint that must have been brought a long distance by paleolithic man. Both stone and bone implements are of crude workmanship.

In company with Herr Bächler, I spent some hours studying the sections and searching for animal remains and artifacts. We were successful in finding two bone implements and one chipped quartzite. Teeth and fragments of bones were counted by the dozen. These were chiefly of the cave bear. Remains of the cave lion, the cave panther, badger, marten (*Mustela martes*), ibex, chamois, stag, marmot, otter, and hermit crow have been noted.

The deposits are not indurated and may be worked with as much rapidity as is consistent with careful observation. They consist of materials that have fallen from the ceilings. They cannot be called stratified, and yet more or less definite horizons may be distinguished on account of the relative fineness of the deposits and the variations in color.

What is the age of the industry-bearing deposits of Wildkirchli? In order to arrive at a just estimate one must have a knowledge not only of prehistoric times but also of the Ice Age. According to Penck there were four glacial epochs (with alternating interglacial epochs). These have been named after four streams of southern Germany in the foothills of the Alps: Günz, Mindel, Riss, and Würm glacial epochs respectively, beginning with the oldest. Penck has gone even further and determined three well-defined stages in the final retreat of the Würm glaciation. The stages correspond to temporary advances during the period of retreat. Such stages have left their traces so distinctly in the region about Innsbruck that local names have been applied to them: Bühl, from Kirchbühl at an elevation of 500 meters; Gschnitz at 1200 meters, and Daun at 1600 meters, the latter of course being the most recent.

The barbaric races with which the Romans had to contend had a knowledge of iron. It is estimated that the Bronze Age had its beginning some 3500 years ago. The Alps were then either inhabited or visited throughout their extent by man. We find, for example, bronze weapons in the Flüela pass of the Upper Engadine. The Flüela pass was invaded by ice of the Daun stage. The latter, therefore, antedates the Bronze Age. Prehistoric copper mines have been discovered at two localities in the Austrian Alps. One of these lies at the southern foot of the Übergossene Alp, near Salzburg, at a height of 1500 meters. Neolithic implements were found in the old shafts. Now this locality (Mitterberg) is near the timber-line, and a slight depression of this would render it difficult to establish smelters there. The other copper mine is southeast of Kitzbühel in the Tyrol, at a height of 1900 meters. This mine also must have been occupied later than the Daun stage, at which time the region lay very near the snow-line and was uninhabitable.

Even the whole neolithic period in Switzerland is younger than the Daun stage, whose snow-line lay 300 meters lower than to-day. The minimum time, therefore, that separates us from the Daun stage must be at least 7000 years.

A very long interval of time separates us from the closing epoch (Magdalenian) of the paleolithic period. For we find on the borders of Lakes Constance and Geneva animal remains of the Magdalenian epoch in terraces that are 20 to 30 meters above the present level of these lakes. Magdalenian industry is found in Switzerland well within the area covered by the Würm glaciation. But such stations have not yet been found within that covered by the Bühl stage. It may be taken for granted, therefore, that the Magdalenian industry is older than, or at least contemporaneous with, the Bühl stage, which corresponds, by the way, to the Champlain stage in North America.

The rock shelter of Schweizersbild was occupied by paleolithic man after the Würm glaciation had retreated across the Rhine from Canton Schaffhausen. Here 25,000 stone implements have been found; also many bone implements and some engravings, one being of the mammoth. The paleolithic layers were covered in turn by successive deposits belonging to the neolithic bronze and Roman periods. Taking the thickness of the deposit left since Roman times as representing 2000 years, the time required for the whole series of deposits is estimated at 24,000 years. The total time elapsed since the maximum advance of the Würm glaciation is still longer, 30,000 years being none too high an estimate for it.

When could Wildkirchli have been inhabited? It lies within the region of glaciation. It could not have been occupied during the Würm glacial period, because it is at a height of 1500 meters, while the snow-line of the Würm glaciation was only 1200 meters. It is self-evident that man could not have taken up his abode above the snow-line. Even during the Bühl stage of the glacial retreat the snow-line was still as low as 1500 meters. Man could have come there only after the Bühl stage. But after the Bühl stage we have a different fauna and flora; so that man must have inhabited Wildkirchli before the last (Würm) glacial epoch, that is to say during an interglacial (Riss-Würm) epoch with climatic conditions similar to those of the present day.

During the last glacial epoch the Wildkirchli caverns were filled with ice or snow and hence no deposits of any kind were formed. The sterile layer one-half meter thick at the top of the floor deposits represents the accumulation since the close of the glacial period. If we allow 30,000 years for post-Würmian times we must allow as much more for the last glacial epoch. Thus to reach the Riss-Würm interglacial period and man's occupancy of Wildkirchli caverns would mean going back about 100,000 years. We have here an atypic but pure Mousterian industry, which probably marks the close of the period; for it seems that in France, far removed from the Alps, the Mousterian industry was contemporaneous with a glacial epoch (the Riss) and is therefore much older than that at Wildkirchli.

Fortunately for the science of prehistoric archeology we know now what manner of man was the author of the Mousterian industry. The first discovery that attracted widespread attention to the physical characters of fossil man was that made in 1856 in the valley of the Neander near Düsseldorf, Germany. The circumstances of the find were such as to render it difficult to establish the age of the human remains. That the skull belonged to a type more primitive than any hitherto known was evident from the start to an unprejudiced mind. Corroborative evidence came just ten years later when Dupont found a human lower jaw in the cavern of La Naulette, Belgium, associated with bones of the mammoth and the rhinoceros. The discovery in 1886 of parts of two human skeletons in the cavern of Spy, near Namur, Belgium, furnished still better evidence, as the human remains were accompanied not only with bones of the mammoth and cave bear but also with stone implements of the Mousterian type. As belonging to the same class there should be mentioned Professor Gorjanovič-Kramberger's discovery in 1899 of human bones, artifacts, and fossil animal remains at Krapina, near Agram, the capital of Croatia.

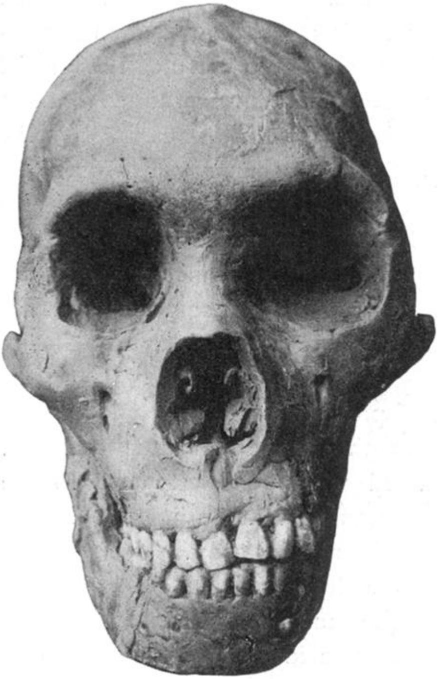

FIG. 139. — *Homo primigenius*, or *mousteriensis*, from the Classic Cavern of Le Moustier (Dordogne). *Norma Facialis.*

During the summer of 1908, Herr O. Hauser found part of a human skeleton, including the skull, in the classic station of Le Moustier itself. This station, belonging to a wonderful series of paleolithic sites in the valley of Vézère, France, has been known since the explorations of Lartet and Christy, 1863–65. Hauser very wisely delayed the removal of the human remains from the cavern of Le Moustier until after the arrival of a party of German anthropologists, including Professor Klaatsch of Breslau, the party going direct from the German Anthropological Congress held at Frankfurt during the first week in August.

Hauser's discovery was made in the lower cave at Le Moustier, and includes not only an almost complete skull (figs. 139, 140) but also various parts of the skeleton of a youth of about fifteen years. At this age, sex cannot be determined from the bones alone. The race characters also are not so distinct as they would be at full maturity; but they point unmistakably to the type of Neandertal, Spy, and Krapina — the so-called *Homo primigenius* which now also becomes *Homo mousteriensis.* It was a rather stocky type, robust and of a medium to low stature. The arms and legs were relatively short, especially the forearm and from the knee down, as is the case among the Eskimo. Ape-like characters are noticeable in the curvature of the radius and of the femur, the latter being also rounder in section than is the case with *Homo sapiens*. In the retreating forehead, prominent brow ridges, and prognathism it is approached to some extent by the modern Australian.

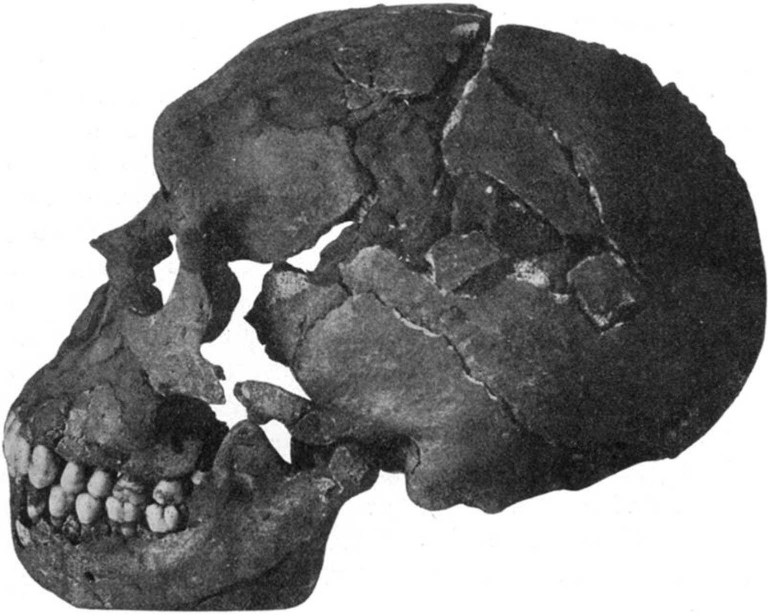

FIG. 140. — *Homo primigenius*, or *mousteriensis*, from the Cavern of Le Moustier (Dordogne). *Norma Lateralis.*

There is, therefore, no longer any doubt as to the physical characters of man of the Mousterian epoch — man that lived in Europe 100,000 years ago. But the Chellean industry is older than the Mousterian, and to the present time no human remains have been found that can with certainty be dated back to the oldest epoch of the paleolithic period. When found, if ever, they will probably be even more primitive in type than *Homo primigenius*. The differences may be great enough to be considered specific, as the Chellean epoch was a long one, reaching well back into the long

Mindel-Riss interglacial epoch. But the Chellean industry already represents a degree of intelligence that must stamp its author as distinctly human — *Homo antiquus* perhaps, but at all events *Homo*. This much cannot at present be said concerning the author of the eolithic industry, particularly in its earliest manifestations. The latter is found not only in the lower Quaternary but also in the Miocene, and even in the Oligocene at Boncelles, a station recently explored by Rutot. From the Oligocene and Miocene up into the lower Quaternary the industry remained practically at a standstill, representing one and the same degree of intelligence.

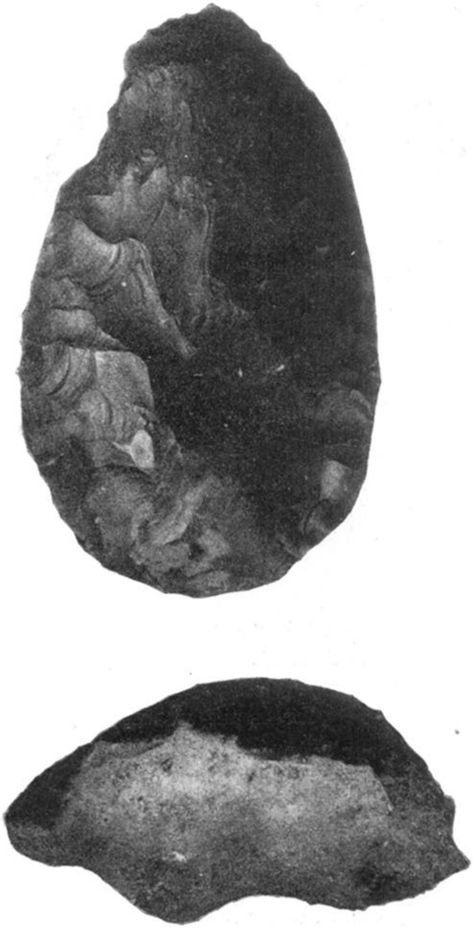

FIG. 141. — Implements of *Homo mousteriensis* from the Lower Grotto of Le Moustier.

The successes of the last year in the search for *Homo primigenius* should encourage anthropologists to continue their search for man of the Chellean epoch and the ancestral form that produced the eolithic industry.[1] The former may indeed prove to be of practically the same type as *Homo primigenius* of Le Moustier, near the outstretched left hand of which was found a carefully finished flint implement of the Acheulian type, as well as a Mousterian scraper. (See fig. 141.)

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[1] The remarkable lower jaw recently found by Professor Schoetensack in Tertiary deposits at Mauer, near Heidelberg, may represent this ancestral type.

It would not be possible to enter here into details relative to all the recent paleolithic discoveries made in Europe. Some of these, like the one at Le Moustier, are at localities known for years and supposed to have been exhausted; as for example, those of Hauser in the classic stations of the Vézère, particularly La Micoque; and of Commont at St Acheul. This should serve to emphasize once more the importance of thoroughness in archeological excavations.

Two new localities that give much promise are La Quina (Charente), a Mousterian station being explored by Giraux and Martin; and Willendorf, near Vienna, which is in the hands of Szombathy and Obermaier. Willendorf is in a terrace about 30 meters above the Danube, the section showing superimposed layers of late Mousterian (Aurignacian), Solutrean, and Magdalenian facies respectively. The greater part of the collection had not yet been unpacked before I left Vienna; but Herr Szombathy, the curator, very kindly showed me the most remarkable single specimen — a human figurine, full length, carved out of stone, with all the steatopygic and negroid characters of the Hottentot race. It came from the upper, or Magdalenian horizon. This may be connected in some way with the paleolithic negroid race discovered by the Prince of Monaco in the *Grotte des Enfants* and named by Verneau *Type de Grimaldi*.

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